

# PATENT ABSTRACTS OF JAPAN

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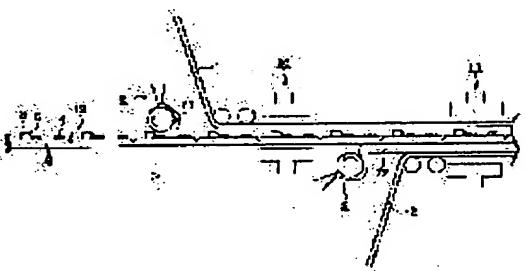
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**(54) MANUFACTURE OF IC CARD**

## 57)Abstract:

**PROBLEM TO BE SOLVED:** To manufacture a non-contact type IC card having excellent smoothness of a front surface and excellent reliability of securely disposed components in a simple step.

**SOLUTION:** The method for manufacturing an IC card in which a component including an IC chip is placed at a predetermined position between two opposed boards and a resin is filled comprises the steps of adhering a resin selected from a thermosetting resin, hot-melt resin and ultraviolet curable resin on both sides simultaneously or respective sides subsequently of a sheet placing the component including the IC chip, and then laminating the boards. And, the boards are laminated by heating or pressurizing.

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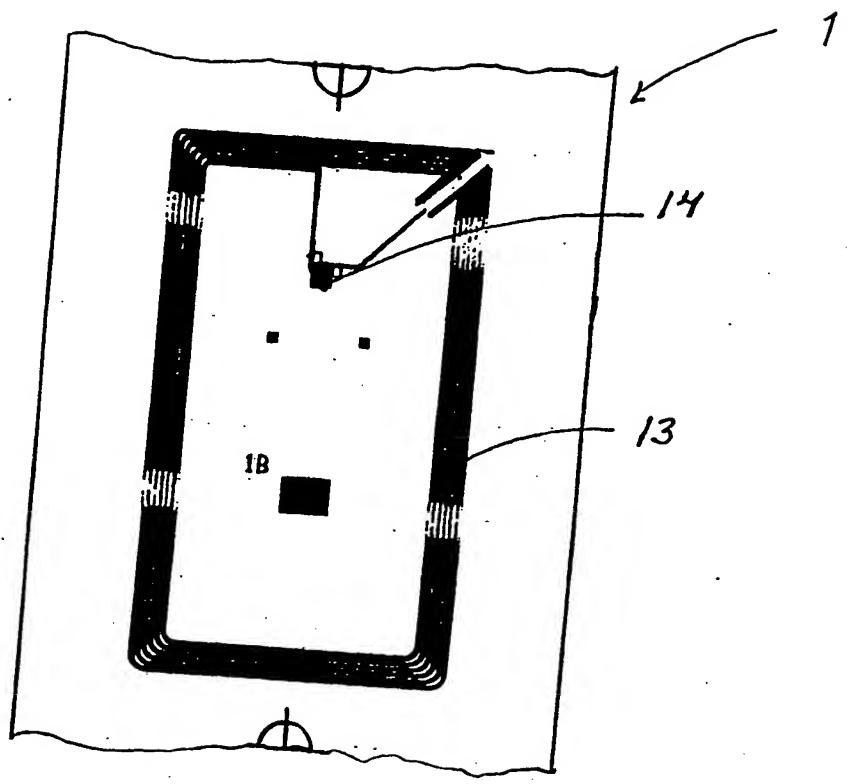


Fig. 1.

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## DETAILED DESCRIPTION

### [Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the manufacture technique of the IC card of a suitable non-contact formula to use for authentication selector cards, such as a driver's license, a personnel certificate, a membership card, an alien registration certificate, and a student identification card.

[0002]

[Description of the Prior Art] In order that the IC card of a non-contact formula may not have parts in a front face, it is advantageous to, printing or preventing matter alteration, and is suitable for the intended use as an authentication selector card (henceforth an ID card). [ forming authentication identification picture images, such as a face picture image, in a front face ] When you use as an ID card, usually, on the surface of one side, the title of a card, a face picture image, a bibliography matter, etc. are carried, and let another side be a note nature front face aiming at an additional publication etc. in many cases.

[0003] By the way, since a working temperature is low as a manufacture method of the IC card of a non-contact formula although the heat pasting method, the adhesives pasting method, and the injection-molding method are learned, and there are few constraints about the card base material to use, a predominance is in selection of the acceptance layer in the hot printing and the sublimation image formation technique of forming an authentication identification picture image and bibliographic information, writing \*\*\*\*, etc., and since the adhesives pasting method is a mass-production method, it is advantageous also to mass production.

[0004] Moreover, these people proposed the manufacture technique which forms the resin layer in the substrate sheet beforehand, and encloses parts in this resin layer (Japanese Patent Application No. 275702 [ nine to ] etc.).

[0005]

[Problem(s) to be Solved by the Invention] However, since it is filled up with a resin after the adhesives pasting method lays the parts which include IC chip beforehand in a position, a joint separates from it with the shearing force by flow of a resin, or it has the problem which originates in a flow and cooling of a resin, spoils surface smooth nature, and lacks in a stability that it is as that irregularity arises \*\*\*\*. Moreover, although forming the face picture image for authentication identification in recent years by the heat-of-sublimation imprint method which is excellent in resolution with high gradation is often performed, since the smooth nature of an image formation side is demanded, a heat-of-sublimation imprint method can be adopted as the face image formation to the card with the irregularity of such a front face especially in the image formation in a heat-of-sublimation imprint method. About this, although improved by the aforementioned resin layer enclosing method, irregularity is not necessarily solved completely and it has the same technical problem. Furthermore, if the flattening of the front face is carried out with a heat press after pasting, the parts (antenna etc.) containing IC chip may move.

[0006] In addition, in such manufacture technique, moreover, since an antenna etc. maintained parts at the position on a sheet and it maintained an oscillation frequency at a predetermined value in every point and two or more combination, it needed to lay so that the configuration of a loop might not be confused, and two or more parts were set within the limit, the frame after installation was removed [ the robot was used, or ], and it was complicated in process. Furthermore, by the technique of putting in IC chip, an antenna, etc. between the sheets of two sheets, pasting up, and producing an IC card, irregularity had arisen in the outside surface of the sheet of the side holding IC chip etc.

[0007] It is in manufacturing the IC card of the non-contact formula which this invention is made in view of the above-mentioned situation, excels [ purpose / the ] in surface smooth nature, and parts are certainly arranged, and is excellent in a reliability at a simple process.

[0008]

[Means for Solving the Problem] The parts which include IC chip in the position between two substrates which the above-mentioned purpose of this invention counters are carried. On both sides of a sheet which laid the parts containing the aforementioned IC chip in manufacturing the IC card with which it comes to fill up a resin After making the resin chosen out of the resin of a heat-hardened type, hot-melt type, or ultraviolet-rays hardening type [ simultaneous or ] one side at a time adhere, therefore, it is attained by performing the manufacture technique of the IC card which passes through the process which pastes the aforementioned substrate together, and pasting of the aforementioned substrate in heating or pressure treatment.

[0009] That is, this invention person thought that the problem which reduces the amount of resins by the side of parts, and originates in a flow of a resin would be avoided, and resulted in this invention while he laid the parts which include IC chip beforehand in the sheet and regulated the position of each part article.

[0010]

[Embodiments of the Invention] Although the operation gestalt is mentioned and this invention is explained hereafter, the mode of this invention is not limited to this.

[0011] The 1st substrate which has the television layer to which drawing 1 shows one example of the card manufactured by the manufacture technique of this invention using the resin sheet with which the parts containing IC chip are unified, and 1 receives a heat-of-sublimation transfer picture to an outside surface, and 2 are the 2nd substrate which has writing \*\*\*\* in an outside surface. In case the ink which consists of a sublimability color is heated by the thermal head and thermal diffusion of the television layer is carried out, it consists of a material to which the trap of the color is carried out and it is fixed, for example, the vinyl chloride, the polyacetal, the poly-butylal, etc. are known as a good television layer. Generally, the material of these television layers is used as powder, is melted by solvents, such as an isocyanate, and is applied and dried by the gravure coating machine etc., and a solvent volatilizes and is formed. Since the picture image formed was emphasized, or the base material of the 1st substrate which forms this television layer made the white pigment mix, the foam was inserted into the honeycomb structure, for example, it is formed from a polyethylene terephthalate (PET), polypropylene (PP), polyester, polyethylene, polystyrene, nylon, etc.

[0012] At this time, although the impression pulse width of a thermal head is changed and the amount of thermal diffusion of sublimability color ink is controlled to give gradation for every dot by the thermal head in order to form the multi-gradation picture image for authentication identification in a television layer, if the base material of a substrate is the honeycomb structure of cellular entering, the hit by the thermal head becomes uniform, since adiathermancy is good, the piece of each dot also becomes good, and a good picture image can be acquired.

[0013] After writing \*\*\*\* distributes a calcium carbonate, a silica particle, etc. for example, to a polyester emulsion, distributes a particle in the resin solution melted by the solvent like the television layer and applies it by the gravure coating machine etc., it makes through and a solvent evaporate and forms a dryer part.

[0014] When carrying out heating pressurization, although the base material of the 2nd substrate is good from [ any ] an original demand function, since a flat field is acquired, it is desirable [ the one of curvature where the double-sided material configuration is more symmetrical is small, and ] to make it the 1st base material and identity of a substrate.

[0015] It is beforehand laid in the resin sheet 6 with the coil-like antenna 4 joined by the joint 5, the account substrate of back to front to which the resin 7 was made to adhere is pasted together, and the IC chip 3 constitutes an IC card. As a resin sheet 6, PET, PP, polyester, polyethylene, nylon, etc. are employable.

[0016] What is necessary is just to choose a resin 7 from a heat-hardened type, hot-melt type, or ultraviolet-rays hardening type thing. All of the special type reaction type with which it is things, such as ethylene and a vinyl acetate copolymer (EVA) system, a polyester system, a polyamide system, a thermoplastic-elastomer system, and a polyolefine system, and hardening is promoted by ordinary temperature type a thing or moisture as a heat-hardened type resin as things, such as an epoxy system, a phenol system, an urethane system, and a unsaturated-polyester system, and a hot-melt type resin can adopt an epoxy system and an acrylic thing as an ultraviolet-rays hardening type resin.

[0017] Although IC modular component which has an antenna coil was shown in drawing, an antenna pattern may use what is formed in the flexible print film substrate. The polyimide is advantageous, when thermoplastic films, such as polyester, are used and thermal resistance is further demanded as a printed circuit board. In this case, the junction to IC chip and an antenna pattern is performed using electroconductive glues (EN-4000 series of Hitachi Chemical, XAP series of TOSHIBA CHEMICAL, etc.), such as a silver paste, a copper paste, and a carbon paste, and anisotropy electric conduction films (Hitachi Chemical \*\*\*\*\* etc.).

[0018] What is necessary is for the combination of a UV irradiation and a pressure press etc. just to perform

pasting of a substrate, when using the combined use with the heat pressing method, a vacuum press method, a pressure roller, and a press, and an ultraviolet-rays hardening type resin.

[0019] The schematic diagram of the process of one example of the manufacture technique of this invention is shown in drawing 2. In addition, since it is drawing shown typically, the size and thickness of parts, the thickness of a material, etc. have been exaggerated and drawn.

[0020] In drawing, the resin sheet 6 with which the coil-like antenna 4 joined to the IC chip 3 and this chip by the joint 5 was laid beforehand is conveyed in the orientation of the arrow head, and a resin 71 is first applied by the offset coating machine 8 as adhesives. Subsequently, the 1st substrate 1 which has the television layer which receives a heat-of-sublimation transfer picture puts on an outside surface, and it is pasted together at the heat press process 10. In addition, it is more desirable carrying out by putting in block a part for a sheets [ several ] card from the viewpoint of luminous efficacy rather than performing a press by the sheet.

[0021] Furthermore, a resin 72 is applied to a rear-face side by the offset coating machine 9 as adhesives, the 2nd substrate 2 which has writing \*\*\*\* in an outside surface piles up, and it is pasted together at the heat press process 11. After it is applied before the heat press process 10 and substrates 1 and 2 pile up, the heat press of both the resins 71 and 72 may be carried out simultaneously. In addition, it is the perforation or slit which helps to make a cut smooth in judging 12 behind and using it as the card of a sheet.

[0022] Since the 2 liquid mixture type is in use as such a resin when using an epoxy system adhesion resin as resins 71 and 72, in the offset coating machines 8 and 9, it mixes directly, and, as for an adhesive property, it is good that it is made to be formed on an offset coating machine. In this case, when a churning means is established and it is spread on a card, it is made to be mixed uniformly. Moreover, in the case of a hot-melt resin, especially a reaction type hot-melt resin, since it is easy to be influenced of moisture, it is desirable to establish a means to intercept so that moisture may not enter to the hopper which holds a resin from a nozzle etc. at the time of a process halt.

[0023] Thus, since it considers as the gestalt put through an adhesion resin among vertical both substrates after making IC chip and an antenna hold beforehand on a central sheet just before \*\*\*\* pasting, in asymmetry of the central sheet resulting from the physical characteristics (thermal conductivity, specific gravity, the specific heat, a degree of hardness, elasticity, etc.) of IC chip which is a foreign matter, an antenna, etc. differing, adhesives do not influence the role of a cushion up to a substrate front face sure enough.

[0024] In addition, employable desirable modes are enumerated below.

[0025] 1) 2 which inserts the sheet of a 10-100-micrometer resin in the interior side of a card of one substrate as a cushion layer which absorbs stress 3 which the metallic foil sheet which thermal conductivity is raised to a central sheet and makes thermal diffusion equalize is made to rival, or inserts this metallic foil sheet in somewhere in interior of a card IC chip, an antenna, etc. are built into the interior of a resin sheet of the porous material like a nonwoven fabric, and it considers as a central sheet (refer to JP,9-275184,A and 4) 5 which carries out timing control and is inserted among both substrates using the central sheet cut beforehand While coated the adhesive resin and a central sheet is carried on a substrate. When 6 \*\* ultraviolet-rays hardening type resin which covers moreover by the adhesive resin, and carries and presses the substrate of another side is used, Perform a UV irradiation a little early about 0.5 to 5 seconds, bring hardening forward, and paste together. \*\* 7 which \*\*'s 1 second to about 10 minutes, brings hardening forward in high humidity air, and is pasted together when using a hot-melt type resin and which has the effect by which the elasticity at the time of pasting is both stabilized An application of the resin to a central sheet is performed using a spray type application machine.

[0026]

[Effect of the Invention] According to this invention, since the account substrate of back to front to which the resin chosen out of the resin of a heat-hardened type, hot-melt type, or ultraviolet-rays hardening type [ simultaneous or ] one side at a time was made to adhere is pasted together on both sides of a sheet which laid the parts containing IC chip, the position of each part article is regulated by them and it does not produce un-arranging in accordance with a flow and cooling of a resin on them,, either.

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[Translation done.]

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**CLAIMS**

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**[Claim(s)]**

[Claim 1] The manufacture technique of the IC card characterized by to pass through the process which pastes the aforementioned substrate together on them in manufacturing the IC card with which the parts which include IC chip in the position between two substrates which counter are carried, and it comes to fill up a resin after making the resin chosen out of the resin of a heat-hardened type, hot-melt type, or ultraviolet-rays hardening type [ simultaneous or ] one side at a time adhere to the both sides of a sheet which laid the parts containing the aforementioned IC chip.

[Claim 2] The manufacture technique of the IC card according to claim 1 characterized by pasting the aforementioned substrate together in heating or pressure treatment.

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[Translation done.]

## DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] Drawing showing one example of the card manufactured by the manufacture technique of this invention.

[Drawing 2] The schematic diagram of the process of one example of the manufacture technique of this invention.

[Description of Notations]

1, 2 Substrate

3 IC Chip

4 Coil-like Antenna

5 Joint

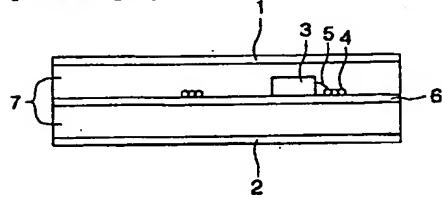
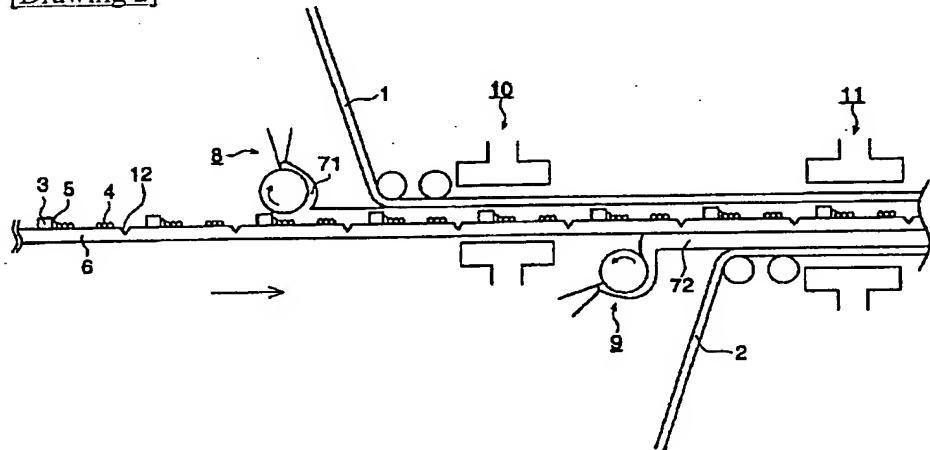
6 Resin Sheet

7 Resin

8, 9 Offset coating machine

10, 11 Heat press process

12 Perforation or Slit

[Drawing 1][Drawing 2]

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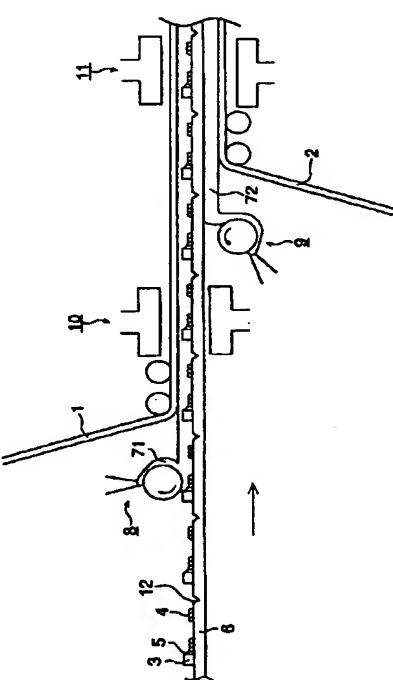
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(54)【発明の名称】 ICカードの製造方法

(57)【要約】

【課題】 表面の平滑性に優れ、部品が確実に配置され  
て信頼性に優れる非接触式のICカードを簡易な工程で  
製造する。

【解決手段】 対向する2つの基板間の所定の位置にIC  
チップを含む部品が搭載され、樹脂が充填されてなる  
ICカードを製造するにあたり、前記ICチップを含む  
部品を載置したシートの両側に、同時に又は一方ずつ、  
熱硬化型、ホットメルト型又は紫外線硬化型の樹脂から  
選ばれる樹脂を付着させた後、前記基板を貼合する工程  
を経るICカードの製造方法、及び前記基板の貼合を加  
熱又は加圧処理にて行うこと。



## 【特許請求の範囲】

【請求項1】 対向する2つの基板間の所定の位置にICチップを含む部品が搭載され、樹脂が充填されてなるICカードを製造するにあたり、前記ICチップを含む部品を載置したシートの両側に、同時に又は一方ずつ、熱硬化型、ホットメルト型又は紫外線硬化型の樹脂から選ばれる樹脂を付着させた後、前記基板を貼合する工程を経ることを特徴とするICカードの製造方法。

【請求項2】 前記基板の貼合を加熱又は加圧処理にて行うことを特徴とする請求項1に記載のICカードの製造方法。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は運転免許証、社員証、会員証、外国人登録証、学生証等の認証識別カードに用いるのに好適な非接触式のICカードの製造方法に関する。

## 【0002】

【従来の技術】非接触式のICカードは部品が表面に無いために、表面に顔画像等の認証識別画像を形成したり、印刷を行ったり、儀表改造を防止するのに有利で認証識別カード（以下、IDカードとも言う。）としての用途に好適である。IDカードとして用いる場合は、通常、一方の表面にはカードのタイトル、顔画像、書誌事項等が搭載され、他方は追加記載等を目的とした筆記性表面とされることが多い。

【0003】ところで、非接触式のICカードの製造方式としては、熱貼合法、接着剤貼合法及び射出成形法が知られているが、このうち接着剤貼合法は加工温度が低く、使用的するカード基材に関する制約が少ないため、認証識別画像や書誌情報を形成する熱転写及び昇華画像形成方法での受容層、筆記性層等の選択に優位性があり、また連続生産方式なので量産にも有利である。

【0004】又、本出願人は予め基板シートに樹脂層を形成しておいて該樹脂層内に部品を封入する製造方法を提案した（特願平9-275702号等）。

## 【0005】

【発明が解決しようとする課題】しかしながら、接着剤貼合法は予めICチップを含む部品を所定の位置に載置してから樹脂を充填するために、樹脂の流動による剪断力で接合部が外れたり、樹脂の流動や冷却に起因して表面の平滑性を損なって凹凸が生じたりと安定性に欠ける問題がある。また近年、認証識別用の顔画像を高階調で解像度に優れる昇華熱転写方式で形成することがしばしば行われるが、昇華熱転写方式での画像形成では特に画像形成面の平滑性が要求されるため、この様な表面の凹凸があるカードへの顔画像形成には昇華熱転写方式が採用できることになる。これについては、前記樹脂層封入法で改善されるものの、完全に凹凸が解消する訳ではなく、同様の課題を有している。更に貼合後に熱プレス

によって表面を平坦化すると、ICチップを含む部品（アンテナ等）が移動してしまう場合がある。

【0006】加えて、これらの製造方法においては、部品を1点ごと又は複数の組み合わせでシート上の所定の位置に、しかもアンテナ等は発振周波数を所定値に保つためループの形状が乱れない様に載置する必要があり、ロボットを使用したり、複数部品を枠内にセットして載置後枠を外したりして工程的には繁雑であった。更に、2枚のシートの間にICチップやアンテナ等を入れて接着しICカードを作製する方法では、ICチップ等を保持した側のシートの外表面に凹凸が生じてしまっていた。

【0007】本発明は上記の事情に鑑みてなされたものであり、その目的は、表面の平滑性に優れ、部品が確実に配置されて信頼性に優れる非接触式のICカードを簡単な工程で製造することにある。

## 【0008】

【課題を解決するための手段】本発明の上記目的は、対向する2つの基板間の所定の位置にICチップを含む部品が搭載され、樹脂が充填されてなるICカードを製造するにあたり、前記ICチップを含む部品を載置したシートの両側に、同時に又は一方ずつ、熱硬化型、ホットメルト型又は紫外線硬化型の樹脂から選ばれる樹脂を付着させた後、前記基板を貼合する工程を経るICカードの製造方法、及び前記基板の貼合を加熱又は加圧処理にて行うこと、によって達成される。

【0009】即ち本発明者は、予めICチップを含む部品をシートに載置して各部品の位置を規制すると共に、部品側の樹脂量を低減して樹脂の流動に起因する問題を避けようと考え、本発明に至った。

## 【0010】

【発明の実施の形態】以下、実施形態を挙げて本発明を説明するが、本発明の態様はこれに限定されない。

【0011】図1はICチップを含む部品が一体化されている樹脂シートを用いて本発明の製造方法で製造されたカードの1例を示すもので、1は外表面に昇華熱転写画像を受容する受像層を有する第1の基板、2は外表面に筆記性層を有する第2の基板である。受像層は、昇華性染料からなるインクがサーマルヘッドで加熱されて熱拡散する際、染料をトラップして定着させる素材で構成され、例えば塩化ビニル、ポリアセタール、ポリブチラール等が良好な受像層として知られている。一般的には、これらの受像層の材料が粉末にされて、イソシアネート等の溶剤に溶かされ、グラビアコータ等で塗布されて乾燥され、溶剤が揮発して形成される。該受像層を形成する第1の基板の支持体は、形成される画像を引き立たせるために、白色の顔料を混入させた、或いは気泡をハニカム構造に折り込んだ、例えばポリエチレンテレフタレート（PET）やポリプロピレン（PP）、ポリエステル、ポリエチレン、ポリスチレン、ナイロン等で形

成される。

【0012】受像層に認証識別用の多階調画像を形成するには、サーマルヘッドでドット毎に階調を持たせる様に、サーマルヘッドの印加パルス幅を変化させて、昇華性染料インクの熱拡散量を制御するが、この時に、基板の支持体が気泡入りのハニカム構造であると、サーマルヘッドとの当たりが均一となり、断熱性が良いので各ドットの切れも良くなり、良好な画像を得ることができると。

【0013】筆記性層は、例えばポリエステルエマルジョンに炭酸カルシウム、シリカ微粒子等を分散したものであり、受像層と同様に溶剤で溶かした樹脂溶液に微粒子を分散して、グラビアコーダ等で塗布してから、乾燥部を通し、溶剤を気化させて形成する。

【0014】第2の基板の支持体は、本来の要求機能から何でも良いが、加熱加圧する場合は、両面の素材構成が対称である方が反りが小さく、平坦な面が得られるので、第1の基板の支持体と同一にするのが好ましい。

【0015】ICチップ3は接合部5により接合されたコイル状アンテナ4と共に樹脂シート6に予め載置され、樹脂7を付着させた後前記基板が貼合されてICカードを構成する。樹脂シート6としては、PET、PP、ポリエステル、ポリエチレン、ナイロン等が採用できる。

【0016】樹脂7は熱硬化型、ホットメルト型又は紫外線硬化型のものから選択すればよい。熱硬化型樹脂としては、エポキシ系、フェノール系、ウレタン系、不飽和ポリエステル系等のもの、ホットメルト型樹脂としては、エチレン・酢酸ビニル共重合体(EVA)系、ポリエステル系、ポリアミド系、熱可塑性エラストマー系、ポリオレフィン系等のもので、常温タイプのもの又は水分によって硬化が促進される特殊タイプの反応型のいずれも、紫外線硬化型樹脂としては、エポキシ系、アクリル系のものが採用できる。

【0017】図にはアンテナコイルを有するICモジュール部品を示したが、アンテナパターンが可挠性のプリントフィルム基板に形成されているものを用いてもよい。プリント基板としては、ポリエステル等の熱可塑性のフィルムが用いられ、更に耐熱性が要求される場合はポリイミドが有利である。この場合、ICチップとアンテナパターンとの接合は銀ペースト、銅ペースト、カーボンペースト等の導電性接着剤(日立化成工業のEN-4000シリーズ、東芝ケミカルのXAPシリーズ等)や、異方性導電フィルム(日立化成工業製アニソルム等)を用いて行う。

【0018】基板の貼合は、熱プレス法、真空プレス法、圧力ローラとプレスとの併用、紫外線硬化型樹脂を用いる場合は紫外線照射と圧力プレスとの組み合わせ等により行えばよい。

【0019】図2に本発明の製造方法の1例のプロセス

の概略図を示す。尚、模式的に示す図であるので、部品の大きさ・厚さ、材料の厚さ等は誇張して描いてある。

【0020】図においては、ICチップ3及び該チップと接合部5により接合されたコイル状アンテナ4が予め載置された樹脂シート6が矢印の方向に搬送され、まずオフセットコーダ8により接着剤として樹脂71が塗布される。次いで外表面に昇華熱転写画像を受容する受像層を有する第1の基板1が重ねられて、熱プレス工程10で貼合される。なおプレスは枚葉で行うよりも、カード数枚分を一括して行うのが効率の観点から好ましい。

【0021】更に裏面側にオフセットコーダ9により接着剤として樹脂72が塗布され、外表面に筆記性層を有する第2の基板2が重ねられて、熱プレス工程11で貼合される。樹脂71及び72は共に熱プレス工程10の前に塗布されて、基板1及び2が重ねられた後、同時に熱プレスされてもよい。尚、12は後に裁断して枚葉のカードにするにあたり、カットをスムーズにするのを助けるミシン目又はスリットである。

【0022】樹脂71及び72としてエポキシ系接着樹脂を用いる場合、その様な樹脂としては2液混合タイプが主流であるので、オフセットコーダ8及び9において直接混合して接着性はオフセットコーダ上で形成される様にするのがよい。その場合、搅拌手段を設けてカード上へ展延される時点で均一に混合されている様にする。又、ホットメルト樹脂特に反応型ホットメルト樹脂の場合は、温氣の影響を受けやすいので、工程停止時にノズル等から樹脂を保持するホッパー等へ温氣が入り込まない様に遮断する手段を設けるのが好ましい。

【0023】この様に、中心シートにICチップやアンテナを予め又は貼合の直前に保持させた後、上下両基板の間に接着樹脂を介して挟み込む形態とするので、異物であるICチップ、アンテナ等の物理的特性(熱伝導性、比重、比熱、硬度、弾性等)が異なることに起因する中央シートの歪みも、接着剤がクッションの役割を果たして基板表面までは影響しない。

【0024】その他採用できる好ましい態様を以下に列挙する。

【0025】1) 少なくとも一方の基板のカード内部側に応力を吸収するクッション層として10~100μmの樹脂のシートを挿入する

2) 中央シートに熱伝導性を高め熱拡散を均一化しめる金属箔シートを張り合わせる、又は該金属箔シートをカード内部のどこかに挿入する

3) ICチップやアンテナ等を不織布の様な多孔質の樹脂シート内部に組み込んで中央シートとする(特開平9-275184号、同9-286189号参照)

4) 予めカットされた中央シートを用い、タイミング制御して両基板間に挟む

5) 接着性樹脂をコーティングした一方の基板上に中央シートを載せて、その上を接着性樹脂で覆い、他方の

基板を載せてプレスする

- 6) ①紫外線硬化型樹脂を用いる場合、0.5~5秒程度早めに紫外線照射を行い硬化を早めておいて貼合する、②ホットメルト型樹脂を用いる場合、高湿度空気内に1秒~10分程度曝して硬化を早めておいて貼合する、どちらも貼合時の弾性が安定する効果を有する
- 7) 中央シートへの樹脂の塗布をスプレー型塗布機を用いて行う。

【0026】

【発明の効果】本発明によれば、ICチップを含む部品を載置したシートの両側に、同時に又は一方ずつ、熱硬化型、ホットメルト型又は紫外線硬化型の樹脂から選ばれる樹脂を付着させた後前記基板を貼合するので、各部品の位置が規制され、樹脂の流動や冷却に伴う不都合も生じない。

【図面の簡単な説明】

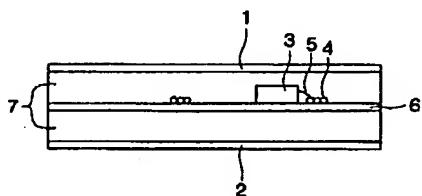
【図1】本発明の製造方法で製造されたカードの1例を示す図。

【図2】本発明の製造方法の1例のプロセスの概略図。

【符号の説明】

- 1, 2 基板
- 3 ICチップ
- 4 コイル状アンテナ
- 5 接合部
- 6 樹脂シート
- 7 樹脂
- 8, 9 オフセットコーナ
- 10, 11 熱プレス工程
- 12 ミシン目又はスリット

【図1】



【図2】

